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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/770,538	01/26/2001	Zheng J. Geng	80169-0026 (GNX-026)	6786

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EXAMINER

NGUYEN, JENNIFER T

ART UNIT	PAPER NUMBER
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2674

DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/770,538

Applicant(s)

GENG, ZHENG J.

Examiner

Jennifer T Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2001.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 7-9, 15-17, 28 and 29 is/are allowed.
6) ☒ Claim(s) 1, 4-6, 10, 13, 14, 18, 22, and 25-27 is/are rejected.
7) ☒ Claim(s) 2, 3, 11, 12, 19-21, 23 and 24 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is responsive to amendment filed on 03/01/2004.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by Tsao (U.S. Patent No. 6,302,542).

Regarding claim 18, referring to Figs. 1, 5d, 5e, and 11, Tsao teaches a method of providing a volumetric three-dimensional display device, comprising the steps of: rotating a helical display screen that sweeps out a cylindrical three-dimensional display space (Figs. 5d and 5e); projecting two-dimensional slices (14a) of a three-dimensional data set on said rotating helical screen so as to generate a three-dimensional volumetric display on said screen; selectively projecting a two-dimensional image that is superimposed on said three-dimensional volumetric display, wherein said selective projection of said two-dimensional image is synchronized with rotation of said rotating helical display screen (see abstract, from col. 3, line 19 to col. 4, line 40, and col. 5, lines 1-44).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 4, 10, 22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (U.S. Patent No. 5,162,787) in view of Shaffer et al. (U.S. Patent No. 6,050,690).

Regarding claims 1, 10, and 22, referring to Figs. 11-15 and 17, Thompson teaches a volumetric three-dimensional display device (900) with an interactive pointer (635), the device comprising: a rotating helical display screen (900) that sweeps out a cylindrical three-dimensional display space; a projector (10) for projecting two-dimensional slices of a three dimensional data set on said rotating helical display screen (900) so as to generate a three dimensional volumetric display on said rotating helical display screen (100); and a laser pointer (635) generating a continuously laser beam (from col. 17, line 57 to col. 20, line 12, and col. 23, lines 17-65).

Thompson differs from claims 1, 10, and 22 in that he does not specifically teach the continuously laser beam is pulsed laser beam. However, referring to Figs. 8 and 9, Shaffer teaches laser beam is pulsed laser beam (col. 8, lines 31-57). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the laser beam is pulsed laser beam as taught by Shaffer in the system of Thompson in order to provide a dynamic interaction with the volumetric 3D display.

Regarding claims 4 and 25, Thompson further teaches projector comprises a spatial light modulator (from col. 17, line 57 to col. 20, line 12, and col. 23, lines 17-65).

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6. Claims 5, 6, 13, 14, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (U.S. Patent No. 5,162,787) in view of Shaffer et al. (U.S. Patent No. 6,050,690) and further in view of Kahn et al. (U.S. Patent No. 5,793,361).

Regarding claims 5, 13, and 26, the combination of Thompson and Shaffer further teaches the laser pointer wireless transmits a signal indicating said pointer's orientation relative to said three-dimensional display space (from col. 17, line 57 to col. 20, line 12).

The combination of Thompson and Shaffer differs from claims 5, 13, and 26 in that it does not specifically teach the laser pointer further comprises an orientation sensor. However, referring to Fig. 3, Kahn teaches a laser pointer comprises an orientation sensor (55) (col. 7, lines 9-67). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the laser pointer further comprises an orientation sensor as taught by Kahn in the system of the combination of Thompson and Shaffer in order to provide sufficiently fast delivery of the sensed data to the display.

Regarding claims 6, 14, and 27, the combination of Thompson, Shaffer, and Kahn further teaches a wireless receiver (72) for receiving said signal indicating said pointer's orientation relative to said three-dimensional display space, wherein said received signal is provided to a central processor (84) of said display device and said three-dimensional volumetric display is modified to indicate that section of said three-dimensional display space at which said pulsed laser beam strikes said rotating helical display screen (from col. 17, line 57 to col. 20, line 12, and col. 23, lines 17-65 of Thompson and col. 7, lines 9-67 of Kahn).

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7. Claims 2, 3, 11, 12, 19-21, 23, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 7-9, 15-17, 28, and 29 are allowed.

Response to Arguments

9. Applicants' arguments filed 03/01/2004, have been fully considered but they are not persuasive because as follows:

In response to Applicants' argument filed "the combination of Thompson and Shaffer fails to teach or suggest a continuously pulsed laser beam". However, Thompson teaches a laser pointer with the beam generators (718-720) can be detected by sensors (655-660) of the display to determine the laser beam along which the pointer is directed into the display. Accordingly, Jacobson obviously teaches the laser beam is continuous laser beam as long as the beam generators are detected by the sensor. Moreover, nowhere does the specification of the invention teach the pulsed laser beam is a continuously pulsed laser beam. The Applicant also argued "Tsao fails to teach or suggest two-dimensional image that is superimposed on said three-dimensional volumetric display. However, Tsao teaches a projector 2D image (15) generates the slice 2D images reflect on the reflector (26), consequently reflected onto the surface of the helical display screen (Figs. 1 and 11, see abstract, from col. 3, line 19 to col. 4, line 40, and col. 5, lines 1-44).

Therefore, it is believed that the limitations of claims 1, 4-6, 10, 13, 14, 18, 22, and 25-27 are still met by Thompson, Shaffer, Tsao, and Kahn, and the rejection is still maintained.

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10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jennifer T. Nguyen** whose telephone number is **703-305-3225**. The examiner can normally be reached on Mon-Fri from 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richard A Hjerpe** can be reach at **703-305-4709**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, DC. 20231

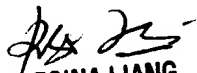
Or faxed to: 703-872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, sixth-floor (Receptionist).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is 703-306-0377.

JNguyen
05/06/2004


REGINA LIANG
PRIMARY EXAMINER